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Regulatory focus and perceptions of ageing: exploring the connections

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Regulatory focus and perceptions of ageing: exploring the connections

Abstract: Perceptions of ageing can become a self-fulfilling prophecy for older adults, with those who hold more negative views of ageing experiencing more negative consequences of the ageing process, including poorer health and cognitive declines~~lower performance on cognitive tests~~. Exposure to negative stereotypes about their group can also affect older adult's performance in cognitive tests, as they are more likely to adopt a prevention focus to avoid mistakes, therefore performing poorly in tasks requiring them to adopt a gains-oriented focus. Based on Regulatory Focus Theory, we hypothesised that negative perceptions of ageing and stereotype threat may be connected, specifically we hypothesised that those with more negative perceptions of ageing would also have a stronger trait prevention focus. Two hundred adults aged 60+ took part in an online questionnaire examining their perceptions of ageing and their trait regulatory focus. Results indicated that negative perceptions of ageing were predictive of a stronger trait prevention focus in a hierarchical multiple regression model. This provides evidence that older adults with more negative perceptions of ageing may adopt a stronger prevention focus, potentially influencing psychological attitudes to everyday tasks and behaviours. Perceptions of ageing and regulatory focus can have implications for the efficacy of health messaging for older adults.

Keywords: Perceptions of ageing, regulatory focus, stereotype threat

Introduction

Perceptions of ageing can be thought of in several ways: how people view ageing as a general process, how they view their own ageing, and how they view older adults as a group (Barber, 2017). Societally, older adults can often be viewed negatively through stereotypes, contributing to the view that they are less valuable to society than younger adults (Ehni & Wahl, 2020). These views may be held by people of all ages, including older adults themselves. Older adults who hold these stereotypes, or negative perceptions of ageing (NPA), must contend with these views becoming applicable to themselves, as they age. Despite media portrayals of older people including more positive examples of ageing, negative stereotypes persist (Robinson & Anderson, 2006; Westerhof, Harink, Van Selm, Strick, & Van Baaren, 2010). Not only is this detrimental for those who are currently in the 'older age' demographic, but also for those who are exposed to these negative views as younger people and will age while holding those views. People who hold the most negative views of older adults, experience worse consequences of their own ageing, and this has been demonstrated in longitudinal research, as well as cohort studies (Freeman et al., 2016; Wurm et al., 2013). NPA are associated with higher incidence of physical illnesses such as poor cardiovascular health, respiratory mortality, and higher incidence of Alzheimer's Disease (Levy et al., 2009; Levy et al., 2016; Levy & Myers, 2005) as well as mental health issues, loneliness and social disengagement (Pikhartova et al., 2015; Robertson & Kenny, 2016). A recent systematic review which included 422 journal articles across 45 countries found reliable effects of ageism, including negative self-perceptions of ageing, in 11 health domains (Chang et al., 2020).

How this happens is not yet fully understood, with many different processes and mechanisms theorised and synthesised in the Stereotype Embodiment Model proposed by Levy (2009) (see also Fawsitt & Setti, (2017)). Three main pathways have been proposed as the mechanisms through which NPA act. These are the physiological, the psychological and the behavioural (Fawsitt & Setti, 2017; Levy, 2009). These pathways propose that the consequences of NPA come about through a lack of engagement in different important aspects of life, including health behaviours, social interaction and the overall effort and interest into maintaining physical and mental health. In order to avoid these negative outcomes for older adults it is important to understand these mechanisms behind these pathways further. One potential mechanism is stereotype threat.

In a review of stereotype threat and perceptions of ageing Fawsitt & Setti, (2017) have argued that the literature on stereotype threat can provide insight into the mechanisms through which NPA act as a catalyst to negative consequences. Stereotype threat was first described as “being at risk of confirming, as self-characteristic, a negative stereotype about one's group” (Steele & Aronson, 1995, p. 797). Stereotype threat is the negative impact on performance when an individual is required to perform on a task for which they are stereotyped. For example, a woman may perform worse at a maths test than she actually could, because she is reminded of the stereotype of women being considered to have poorer performance in tests of mathematical ability (Cadinu et al., 2005). This effect in older adults is moderated by whether they view themselves as older adults, and whether they think others view them as older adults (Barber, 2017). Tests such as those of memory are impacted by being exposed to negative views about ageing, particularly if the individual feels they belong to the older person group or feel at risk of belonging to it. This has been reliably found in three meta-analyses on stereotype threat in older adults (Armstrong et al., 2017; Lamont et al., 2015; Meisner, 2012). The consequences of poor performance on these tests are significant, such as inaccurate results from tests of mild cognitive impairment, potentially leading to incorrect diagnoses (Barber et al., 2015) and anxiety about developing Alzheimer’s disease. The consequences may also be less immediately apparent with perceptions of ageing and stereotype threat influencing engagement with and decisions concerning healthcare (Abdou et al., 2016) as an example of the far reaching impact of being subjected to stereotype threat. Insight on the link between stereotype threat and its consequences can be drawn from the role of regulatory focus in health messaging in younger populations (Garza, 2019; Ludolph & Schulz, 2015). Two mechanisms have been proposed by which this negative prompt acts, i.e. disruptive thoughts interfering with task relevant information in working memory and regulatory mismatch (Armstrong et al., 2017; Barber, 2017). This research highlights the need for a better understanding of the processes underpinning these long term consequences.

Regulatory mismatch is defined as a misalignment between task demands and the way the individual approaches the task itself. Regulatory Focus theory (Higgins, 2000; 1997) posits there are two ways to approach a task, a promotion focus is when someone is interested in making gains and achieving goals, and a prevention focus where someone is interested in avoiding losses and preventing negative outcomes. Tasks themselves often have a promotion or prevention focus as well, such as promoting a gain or preventing a loss. A regulatory mismatch occurs when an individual's and a task's regulatory focus are opposed, and this leads to poorer performance. For example, one may focus on accuracy to avoid a loss in performing a task that rewards speed instead. This is hypothesised to be the process through which stereotype threat in older adults works (Barber, 2017; Barber & Mather, 2013). Importantly, each individual is characterised by a trait regulatory focus, which represents a default position (Lockwood et al., 2002), while state regulatory focus is the focus one temporarily adopts in a given task, which generally corresponds with their trait regulatory focus, although not necessarily. Stereotype threat in older adults seems to act through regulatory focus mechanisms with stereotype threat inducing a prevention focus in individuals which negatively impacts performance when completing tasks that have a promotion focus (Barber et al., 2015; Gaillard et al., 2011). A large review of studies on regulatory focus suggests that it may be relatively stable across the lifespan and it may be partially based off personality traits (Lanaj et al., 2012).

In sum, a portion of older adults holds NPA, (Levy & Myers, 2004)~~.;~~ Societal ageism also puts older adults under threat when they perform tasks in which the stereotype is that older adults should perform poorly, this effect of threat has been shown experimentally time and again (Armstrong et al., 2017; Lamont et al., 2015; Meisner, 2012). The mechanisms behind the negative effect of stereotype threat are thought to be a mismatch between task demands and individual attitude towards the task, i.e. regulatory focus mismatch. Despite the clear theoretical link between NPA and stereotype threat in the context of Regulatory Focus theory, empirical evidence is lacking on it. There is currently no single measure that indicates an individual's susceptibility to stereotype threat and no study has yet examined its relationship with NPA.

The present study aims to explore cross-sectionally the association between perceptions of ageing and trait regulatory focus, We hypothesise that older adults who internalise negative stereotypes of ageing are more likely to adopt a trait prevention focus (Fawsitt & Setti, 2017). This is of relevance to understand the mechanisms behind NPA and their negative outcomes, as well as of applied relevance to establish whether trait focus is a potentially modifiable factor related to such mechanisms. In order to test this measures of trait regulatory focus and perceptions of ageing will be administered with other potential confounding factors also measured such as affect, age, medication use and cognitive failures. These factors have all been linked to perceptions of ageing. A measure of self-reported cognitive failures was included as there is evidence of links between performance on cognitive measures and perceptions of ageing (Sindi et al., 2012) ~~although this has not been explored using self-reported measures~~. Affect has been found to influence scores on regulatory focus questionnaires ~~and~~ with negative affect being linked to a prevention focus (Gorman et al., 2012). Perceptions of ageing have also been linked to affect (Bellingtier & Neupert, 2017), in order to understand any role this variable plays, participants completed the Positive and Negative Affect Scale.

Method

Participants

Participants were 200 adults aged 60+ recruited from across the UK and Ireland through an online site (Prolific). This sample size was chosen based on a priori power calculations carried out in G*Power (Faul et al., 2009). A sample of 146 was required based on a six predictor variable equation with a medium effect size with an alpha = 0.05 and a power = 0.95. A sample size of 200 was chosen to ensure dropout or exclusion on other factors was not an issue. Prolific works by advertising studies to potential participants on Prolific with an estimated completion time, reward, and eligibility criteria. Participants were mostly female (n=123) and overall healthy (n= 16 took five or more medications regularly). Participants were asked their age in years, their sex with an option to not provide that information, the level of schooling achieved, their current marital status, and the number of daily medications as a measure of polypharmacy. Participants' ages ranged from 60 to 85 years. The average age of participants was 65.39 (Standard Deviation (SD)=4.43). Participants took on average of 2.72 medications a day with less than ten percent of participants taking more than five a day. Participants were reimbursed at an average of £11.25 per hour. The study was approved by the School of Applied Psychology Ethics Committee, University College Cork.

Material

Trait Regulatory Focus Questionnaire

Participants completed the Promotion/Prevention Scale from (Lockwood et al., 2002) to measure participants' trait regulatory focus. This questionnaire was chosen as it targets the present time, unlike several other~~s~~ ~~comprising~~ measures which use questions about individuals childhood’s which are less relevant to older adults (Haws et al., 2010; Higgins et al., 2001). This consists of two scales, with 9 items measuring promotion focus and 9 items measuring prevention focus. Each item is a description such as “In general, I am focused on preventing negative events in my life” which participants then answer with a scale ranging from 1 – not true of me at all, to 9 – very true of me. Four questions were not considered relevant for our population, as they related to desired school performance and academic success and were changed to more generally apply to an older adult’s life (Lockwood et al., 2005). The modified version is available in Appendix 1. Scores from each scale are summed to give two independent scales, one indicating an individual’s promotion focus, and the other their prevention focus. Both subscales were reliable (promotion α=.89, prevention α=.77), and had a small correlation with one another (r=.198, p <.01).

Brief-Perceptions of Ageing Questionnaire

The Brief-Ageing Perceptions Questionnaire (B-APQ) is a measure of an individuals’ perceptions of ageing and is made up of 17 Likert scale items where ~~that~~ participants are asked to select their level of agreement or disagreement, from Strongly Agree, Agree, Neither Agree nor Disagree, Disagree, Strongly Disagree). The 17 statement items are categorised into five domains, Timeline-Chronic (e.g. I feel my age in everything that I do), Consequences Positive (e.g. as I get older I get wiser), Emotional Representations (e.g. I get depressed when I think about how ageing might affect the things that I can do), Consequences and Control Negative (e.g. Getting older makes me less independent), and Control Positive (e.g. Whether I continue living life to the full depends on me). An overall score for Perceptions of Ageing is created by summing all scales after reverse scoring Consequences Positive and Control Positive. This gives a range of possible scores from 17-85, the higher a participant scores the more negative their perceptions of ageing. This summing technique was used in Freeman et al.'s, (2016) paper where B-APQ scores were predictive of the onset and persistence of anxiety and depression in a large representative sample of older adults. The B-APQ has been validated previously on a large population of older adults (Sexton et al., 2014).

Cognitive Failures Questionnaire

In order to control for the cognitive status of participants, the Cognitive Failures Questionnaire (CFQ) scale (Broadbent et al., 1982) was used. The scale asks participants to self-report how often they have experienced an event over the last six months. Participants are asked questions such as “Do you find you forget appointments” and are asked to rate on a scale including Very often, Quite often, Occasionally, Very rarely, Never. Answers are scored from 4 to 0 on individual items which are then summed to give a score from 0-100 meaning the more often participants experience cognitive failures, the higher their score.

Positive and Negative Affect Scale (PANAS)

Positive and negative affect were measured using the Positive and Negative Affect Scale (Watson et al., 1988) which asks participants to rate how much a word describes how they feel right now at this very moment. It consists of 20 items presenting a word (e.g. Interested, alert, irritable, active) which participants endorse on a 1-5 scale from “Very slightly or not at all”, to “Extremely”. It is a combination of two, ten item scales to evaluate positive and negative affect. Scores from both scales are summed creating a positive affect and negative affect score.

Procedure

Participants who met~~fit~~ the demographic requirements were notified of the availability of this study and people who wanted to take part were directed to a consent form and information sheet hosted on Qualtrics, and those who consented continued to complete the study. ~~The questionnaires were presented in order: of~~ Initially participants were presented with a demographics questionnaire to ensure suitability to participant selection criteria. ~~and~~ Then the regulatory focus questionnaire and the B-APQ were presented in counterbalanced order. ~~finishing~~ Finally participants were presented with the Positive and Negative Affect Scale and the Cognitive Failures Questionnaire. These two questionnaires were administered last to ensure they did not influence our main variables as ~~in theory~~ priming about forgetfulness could prompt participants to answer more negatively about their perceptions of ageing and priming negative or positive moods could influence other answers. There was no differences found between participants who answered the PANAS first or the B-APQ first. ~~Demographics were presented first to ensure participants were eligible to participate in the study.~~ Following completion of the questionnaires participants were ~~then~~ brought to a page thanking them for their participation.

Results

Participants’ CFQ mean score was 32.36 (SD = 12.36) in line with data from a similar age range (Knight et al., 2004). The Positive Affect Scale (PAS) and Negative Affect Scale (NAS) means and standard deviations are normal for the population (Watson et al., 1988). ~~The Promotion~~

~~focus questionnaire with a mean of 56.77 and SD of 13.66,.~~ The Brief Perceptions of Ageing Questionnaire ~~which~~ had a mean of 42.27 and SD of 9.25 which is consistent with a large nationally representative sample in an Irish study (Freeman et al., 2016). The promotion and prevention focus scales were standardised and then the prevention scores were taken from the promotion scores to create a difference score [difference score = z(promotion score) – z(prevention score)] representing the strength of promotion relative to prevention scores. This technique was used in the original paper from Lockwood et al., (2002). Higher scores in this difference meaning a stronger promotion focus.

Table 1.

Descriptive Statistics

	N	Mean	Std. Deviation
Age (years)	200	65.39	4.43
Number of medications taken per day	185	2.72	1.72
CFQ (Cognitive Failures Questionnaire)	193	32.36	12.36
B-APQ (Brief-Ageing Perceptions Questionnaire)	200	42.27	9.25
PAS (Positive Affect Scale)	200	31.09	8.02
NAS (Negative Affect Scale)	200	12.05	4.40
Prevention Focus	189	36.77	10.37
Promotion Focus	180	56.77	13.66

Correlations

Exploratory correlations were run to investigate the relationships predicted in our hypotheses. Spearman Correlation was used as the data was non-normally distributed. B-APQ had a large negative correlation with the Promotion-Prevention difference scores r=-.683, n=173, p<.0005.

The B-APQ scores correlated with scores from the CFQ r=.337, n=193, p<.0005, the PAS r=-.495, n=200, p<.0005 and the NAS r=.303, n=200, p<.0005. Only the Regulatory focus questionnaires did not have protocol for missing data so participants with missing data were not included in the final analysis using listwise exclusion.

Multiple regression

To examine these relationships further we performed a hierarchical multiple regression to investigate the contribution of B-APQ scores to the promotion-prevention difference scores, while controlling for age, gender and the PANAS scores. The factors controlled for in step 1 were basic demographic characteristics, i.e. age and sex, these explained less than 1 per cent of variance in promotion-prevention difference scores and were non-significant but were retained for theoretical significance to the model. Step two controlled for affect, i.e. NAS scores and the PAS scores. The second step of the model explained 28 per cent of the variance in promotion-prevention difference scores. Finally, in the third step we examined the contribution of B-APQ scores. The total sample at this step after listwise deletion was n=173. The order of these steps was ~~chosen as step one was controlling~~ first to control for demographic variables, then affect which was a statistically significant confounding variable and finally our independent variable of interest. The total variance explained by the model was 51.5 per cent, F(5, 167) = 37.159, p <.001. The B-APQ scores explained an additional 23 per cent of the variance in promotion-prevention difference scores, after contcollrolling for age and gender, ~~R square~~ R^2 change .23, F Change (1, 167) = 82.458, p<.001. ~~In the final model only the PAS scores and B-APQ were significant.~~ In the final model, only the PAS and BAP-Q scores were significant, and BAP-Q explained a greater amount of variance (beta =.584, p<.001 than the PAS (beta = .219, p<.001). The contribution of the NAS to the model was not statistically significant in this model. With B-

APQ recording a higher beta value (beta=-.584, p<.001) than PAS (beta=.219, p<.001). The statistical significance of the NAS diminished to non-significance. We carried out tests to see if the data met the assumption of collinearity which indicated that multicollinearity was not a concern (NAS, Tolerance = .9, VIF = 1.11).

Table 2.

Table of Regression Coefficients for Standardized Regulatory Focus Scores.

		Unstandardized Coefficients		Standardized Coefficients					
Step	Predictor	B	SE	β	p.	R^2	R^2 change	F	P
1						.006	.006	.514	.599
	Age(years)	-.022	.022	-.077	.315				
	Gender	.031	.200	.012	.876				
2						.296	.29	34.685	<.001
	Age(years)	-.005	.019	-.017	.796				
	Gender	.012	.170	.005	.945				
	PAS	.077***	.010	.486	<.001				
	NAS	-.054**	.019	-.186	.005				
3						.529	.233	82.458	<.001
	Age(years)	.013	.015	.045	.409				
	Gender	-.078	.140	-.030	.577				
	PAS	.035***	.010	.219	<.001				
	NAS	-.015	.016	-.052	.356				
	B-APQ	-.080***	.009	-.584	<.001				

Note. N = 173; *p < .05, **p < .01, ***p< .001 SE= standard error

Discussion

These results suggest that older adults with stronger NPA hold a more preventive regulatory focus. This relationship exists independently of controlling factors including age, sex and affect. The relationship between affect, both positive and negative, and scores on the regulatory focus questionnaire is in line with previous research that has shown these two constructs to be related (Summerville & Roese, 2008). Perceptions of ageing also had a significant relationship with negative and positive affect~~. and~~ Previous research points to an interaction between awareness of age related changes, perceptions of ageing, and daily affect (Bellingtier & Neupert, 2017) ~~as well as~~ with more positive perceptions of ageing being protective of more negative reactivity to daily stressors, measured as negative affect (Bellingtier & Neupert, 2016). Perceptions of ageing can predict changes in daily affect after changes in age related awareness (Bellingtier & Neupert, 2017) and after serious adverse health events (Wolff et al., 2015).

These results provide direction for future research into the ways ~~through~~ by which short and long term effects of negative stereotypes in older adults are connected. ~~Older adults experience more than one set of consequences from being exposed to negative stereotypes, short term consequences~~, Stereotype threat can influence performance in tests and~~, which also~~ contributes to treatment and support decisions, and long term which may influence their health and wellbeing through the physiological, psychological and behavioural pathways (Fawsitt & Setti, 2017; Levy et al., 2009, 2016; Levy & Myers, 2005). These results help connect these two seemingly distinct processes through the mechanism of trait regulatory focus. These results support the hypothesis that the more negative a view of ageing older adults have, the more likely they are to adopt a prevention over promotion focus style.

This research suggests that older adults who have internalised more negative stereotypes related to older age, the ageing process and themselves as older adults, experience stereotype threat which can cause them to adopt a more preventive dispositional focus. These results have theoretical and practical applications. Theoretically, they demonstrate a link between NPA and regulatory focus that can potentially constitute a mechanism behind the long term effects of NPA on mental and physical health. Some research has found that~~for~~ health interventions, prevention focused individuals may require more support early on for success (Fuglestad et al., 2015). One potential pathway highlighted by Fawsitt & Setti (2017) suggests that regulatory focus changes in older adults may lead to ineffective or inefficient strategies around health behaviours. There is research showing the connection between regulatory focus and health behaviours in those with type two diabetes (participants' mean age 61.66 years), finding that patients with a promotion focus had better self-management of the condition (Laroche et al., 2020). This would fit well with Levy's Stereotype Embodiment Theory within the behavioural pathway (Levy, 2009).

These results can contribute to the development and tailoring of practical interventions with older adults who hold NPA. Lockwood et al., (2005) found that older adults respond better to prevention focus health messages than younger adults. There is already some evidence suggesting trait regulatory focus is related to health behaviours (Gomez et al., 2013) and that health messaging tailored to a regulatory focus is more effective (Lin & Yeh, 2017; Uskul et al., 2009). Future research could examine perceptions of ageing's relationship with health related scales of regulatory focus and if this could inform more effective health messaging as regulatory focus has been seen to play a role in some health messaging already (Berezowska et al., 2018). Older adults with more negative perceptions of ageing are more likely to suffer from loneliness (Pikhartova et al., 2015). If it is the case that they also have a more dispositional prevention focus, then this is a potential avenue for intervention. Targeted ~~an~~ awareness messages such as "In order to avoid losing a healthy social circle you should ensure you reach out to people" could be beneficial for this group. Although further research will be needed to examine whether this form of targeted messaging could improve current approaches. Given the link between NPA and poor health behaviours, this study suggests that leveraging on regulatory focus can potentially support healthier behaviours in older adults with NPA.

~~Public health messages could be targeted to particular older adults groups (Pikhartova et al., 2015). As Older adults with more negative perceptions of ageing are more likely to suffer from loneliness if they also have a more dispositional prevention focus. Targeted an awareness messages such as "In order to avoid losing a healthy social circle you should ensure you reach out to people" could be beneficial for this group~~. ~~Although further research will be needed to examine whether this form of targeted messaging would be more effective. Although these assumptions cannot be based off this research alone.~~

Understanding the association between regulatory focus and NPA can inform ~~on~~ the design of cognitive tests for detecting conditions such as mild cognitive impairment and ~~the~~ dementia. Older adults' performance on these tests may currently be being affected by their regulatory focus and/or their perceptions of ageing. ~~in which participants may withdraw from responding because of their prevention focus.~~

~~These results have implications for practical interventions with older adults who hold NPA. Lockwood et al., (2005) found that older adults respond better to prevention focus health messages than younger adults. There is already some evidence suggesting trait regulatory focus is related to health behaviours (Gomez et al., 2013) and that health messaging tailored to a regulatory focus are more effective (Lin & Yeh, 2017; Uskul et al., 2009). Future research could examine perceptions of ageing's relationship with health related scales of regulatory focus and if this could inform more effective health messaging as regulatory focus has been seen to play a role in some health messaging already (Berezowska et al., 2018). Given the link between NPA~~

~~and poor health behaviours, this study suggests that leveraging on regulatory focus can potentially support healthier behaviours in older adults with NPA.~~

In addition, utilising appropriate messaging may contribute to more positive perceptions of ageing. ~~one could assume that small positive changes in may have positive consequences and~~ preliminary findings have found small positive changes in self-perceptions of ageing may have positive consequences ~~this~~ with mental health (Beyer et al., 2019). There have been promising developments with using regulatory focus theory to inform interventions for depression, weight loss, and medication adherence but this research has not focused specifically on older adults (Fuglestad et al., 2015; Laroche et al., 2020; Strauman et al., 2006). Recent research on the efficacy of health messaging for older adults demonstrates potential pathways which could be used to improve older adults health behaviours(O'Connor et al., 2018; Zhang et al., 2019). More research is needed to understand regulatory focus with older adults and the interplay with perceptions of ageing.

Limitations

This study has several limitations. Due to its cross-sectional nature a direction for the association between perceptions of ageing and regulatory focus cannot be discerned. It also relies on an older adult sample recruited online which is clustered at a younger-old age and may not be representative of older adults as a whole. The regulatory focus questionnaire was primarily developed for students and had to be adapted to better suit this population, older adults may require a regulatory focus questionnaire that is tailored to their experiences. The regulatory focus questionnaire used was chosen as there is currently no questionnaire for measuring trait regulatory focus in older adults. Despite these limitations this research builds on our understanding of how NPA and possible mechanisms of stereotype threat fit to influence older adults' psychological states and behaviours.

Conclusions

These results build support for the connection between regulatory focus as a mechanism of negative perceptions of ageing in older adults in a range of domains (Fawsitt & Setti, 2017). Future research should explore the causal nature of this association as it will provide a clearer picture of how perceptions of ageing and stereotype threat are connected. Future research could also examine if these relationships influence the interactions between regulatory focus and perceptions of ageing in relation to health decisions and care seeking behaviours in older adults. This understanding would benefit interventions aimed at improved outcomes in ageing such as health interventions (Keller, 2006) and performance on clinical tests (Barber et al., 2015).

Statement of ethical approval

Ethical approval was gained from the Ethics Board of The School of Applied Psychology, University College Cork.

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Declaration of contribution of authors

Statement of conflict of interest

No conflict of interest declared.

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Appendix 1:

Modified version of the Trait Regulatory Focus Questionnaire

Trait Regulatory Focus scale

Promotion Prevention Scale

Using the scale below, please write the appropriate number in the Blank beside each item

1	2	3	4	5	6	7	8	9
Not at all true of me								Very true of me

1.______In general, I am focused on preventing negative events in my life.

2.______ I am anxious that I will fall short of my responsibilities and obligations.

3.______I frequently imagine how I will achieve my hopes and aspirations.

4.______I often think about the person I am afraid I might become in the future.

5._____I often think about the person I would ideally like to be in the future.

6._____I typically focus on the success I hope to achieve in the future.

7._____I often worry that I will fail to accomplish my goals.

8._____I often think about how I will achieve success.

9._____I often imagine myself experiencing bad things that I fear might happen to me.

10.____I frequently think about how I can prevent failures in my life.

11.____I am more oriented toward preventing losses than I am toward achieving gains.

12.____My major goal right now is to achieve my ambitions.

13.____My major goal right now is to avoid becoming an failure.

14._____I see myself as someone who is primarily striving to reach my “ideal self” to fulfill my hopes, wishes, and aspirations.

15.______I see myself as someone who is primarily striving to become the self I “ought” to be to fulfill my duties, responsibilities, and obligations.

16._____In general, I am focused on achieving positive outcomes in my life.

17._____I often imagine myself experiencing good things that I hope will happen to me.

18.______Overall, I am more oriented toward achieving success than preventing failure.

Appendix 2.

Correlation Table

Correlations

		Regulatory focus	B-APQ total	Polypharmacy	CFQ	PAS	NAS	Age (years)	Gender	Education	Marital status
Regulatory focus	Pearson Correlation	1	-.699**	-.044	-.242**	.511**	-.251**	-.077	.009	.019	.021
	Sig. (2-tailed)		<.001	.582	.002	<.001	.001	.316	.907	.801	.780
	N	173	173	160	168	173	173	173	173	173	172
B-APQ	Pearson Correlation	-.699**	1	.221**	337**	-.495**	.303**	.164*	-.064	.014	-.004
	Sig. (2-tailed)	<.001		.003	<.001	<.001	<.001	.020	.367	.844	.953
	N	173	200	185	193	200	200	200	200	200	197
Polypharmacy	Pearson Correlation	-.044	.221**	1	.156*	-.110	-.032	.152*	-.066	-.058	.166*

	Sig. (2-tailed)	.582	.003		.037	.135	.665	.038	.376	.434	.025
	N	160	185	185	179	185	185	185	185	185	182
Cognitive failure questionnaire	Pearson Correlation	.242**	-.337**	-.156*	1	.291**	-.187**	.033	-.065	-.041	-.089
	Sig. (2-tailed)	.002	<.001	.037		<.001	.009	.650	.373	.570	.220
	N	168	193	179	193	193	193	193	193	193	190
PAS	Pearson Correlation	.511**	-.495**	-.110	-.291**	1	-.129	-.093	-.020	.062	-.101
	Sig. (2-tailed)	<.001	<.001	.135	<.001		.068	.190	.777	.381	.156
	N	173	200	185	193	200	200	200	200	200	197
NAS	Pearson Correlation	-.251**	.303**	-.032	.187**	-.129	1	.079	-.080	.028	-.071
	Sig. (2-tailed)	.001	<.001	.665	.009	.068		.266	.261	.696	.323
	N	173	200	185	193	200	200	200	200	200	197
Age (years)	Pearson Correlation	-.077	.164*	.152*	-.033	-.093	.079	1	.039	-.045	-.055
	Sig. (2-tailed)	.316	.020	.038	.650	.190	.266		.586	.526	.442
	N	173	200	185	193	200	200	200	200	200	197
Gender	Pearson Correlation	.009	-.064	-.066	.065	-.020	-.080	.039	1	-.129	.174*
	Sig. (2-tailed)	.907	.367	.376	.373	.777	.261	.586		.068	.014
	N	173	200	185	193	200	200	200	200	200	197
Education	Pearson Correlation	.019	.014	-.058	.041	.062	.028	-.045	-.129	1	-.001
	Sig. (2-tailed)	.801	.844	.434	.570	.381	.696	.526	.068		.985
	N	173	200	185	193	200	200	200	200	200	197
Marital Status	Pearson Correlation	.021	-.004	.166*	.089	-.101	-.071	-.055	.174*	-.001	1
	Sig. (2-tailed)	.780	.953	.025	.220	.156	.323	.442	.014	.985	
	N	172	197	182	190	197	197	197	197	197	

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).